

## CLAIMS

What is claimed is:

- 1        ~~1.~~    A method comprising:
- 2            transmitting data along a first virtual circuit of a plurality of virtual
- 3        circuits in a network;
- 4            detecting a failure on said first virtual circuit; and
- 5            switching transmission of said data from said first virtual circuit to a
- 6        second virtual circuit of said plurality of virtual circuits in said network.
- 1            2.        The method according to claim 1, wherein said network is an
- 2        Internet Protocol (IP) network.
- 1            3.        The method according to claim 1, wherein said network is an
- 2        Asynchronous Transfer Mode (ATM) network.
- 1            4.        The method according to claim 1, wherein said transmitting
- 2        further comprises:
- 3            transmitting a plurality of detecting cells along said first virtual circuit,
- 4        said second virtual circuit, and each virtual circuit of said plurality of virtual
- 5        ~~circuits.~~

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1           5.     The method according to claim 4, wherein said plurality of  
2     detecting cells are transmitted at a predetermined frequency.

1           6.     The method according to claim 4, wherein each detecting cell of  
2     said plurality of detecting cells is an operation and management (OAM)  
3     loopback cell having a correlation tag with incrementing sequence number.

1           7.     The method according to claim 4, wherein said detecting further  
2     comprises:  
3             receiving said plurality of detecting cells; and  
4             detecting a predetermined gap in said plurality of detecting cells on said  
5     first virtual circuit.

1           8.     The method according to claim 7, wherein said predetermined  
2     gap includes three detecting cells of said plurality of detecting cells.

1           9.     The method according to claim 1, further comprising transmitting  
2     a plurality of detecting cells along each virtual circuit of said plurality of virtual  
3     circuits.

1           10.    The method according to claim 7, further comprising:

2 detecting a predetermined sequence of detecting cells of said plurality of  
3 detecting cells on said first virtual circuit; and  
4 switching transmission of said data from said second virtual circuit to  
5 said first virtual circuit.

1 11. The method according to claim 7, further comprises:  
2 detecting a predetermined sequence of detecting cells of said plurality of  
3 detecting cells on said first virtual circuit; and  
4 maintaining transmission of said data along said second virtual circuit.

1 12. The method according to claim 10, wherein said predetermined  
2 sequence includes five detecting cells of said plurality of detecting cells.

1 13. The method according to claim 1, wherein said data comprises  
2 Asynchronous Transfer Mode (ATM) cells.

1 ~~14.~~ A switch comprising:  
2 a gateway module for transmitting data along a first virtual circuit of a  
3 plurality of virtual circuits in a network;  
4 said gateway module further including a line card for detecting a failure  
5 on said first virtual circuit and switching transmission of said data from said  
6 first virtual circuit to a second virtual circuit of said plurality of virtual circuits.

1 15. The switch according to claim 14, wherein said gateway module  
2 further transmits a plurality of detecting cells along said first virtual circuit,  
3 said second virtual circuit, and each virtual circuit of said plurality of virtual  
4 circuits.

1 16. The switch according to claim 15, wherein said plurality of  
2 detecting cells are transmitted at a predetermined frequency.

1 17. The switch according to claim 15, wherein each detecting cell of  
2 said plurality of detecting cells is an operation and management (OAM)  
3 loopback cell having a correlation tag with incrementing sequence number.

1 18. The switch according to claim 15, wherein said line card further  
2 receives said plurality of detecting cells and detects a predetermined gap in said  
3 plurality of detecting cells on said first virtual circuit.

1 19. The switch according to claim 18, wherein said predetermined  
2 gap includes three detecting cells of said plurality of detecting cells.

1 20. The switch according to claim 15, wherein said line card further  
2 receives said plurality of detecting cells and detects a predetermined sequence  
3 of detecting cells of said plurality of detecting cells on said first virtual circuit.

1 21. The switch according to claim 20, wherein said line card further  
2 switches transmission of said data from said second virtual circuit to said first  
3 virtual circuit.

1 22. The switch according to claim 20, wherein said line card further  
2 maintains transmission of said data along said second virtual circuit.

1 23. The switch according to claim 20, wherein said predetermined  
2 sequence includes five detecting cells of said plurality of detecting cells.

1 24. The switch according to claim 14, wherein said data comprises  
2 Asynchronous Transfer Mode (ATM) cells.

1 ~~25.~~ A computer readable medium containing executable instructions  
2 which, when executed in a processing system, cause the system to perform a  
3 method comprising:

4 transmitting data along a first virtual circuit of a plurality of virtual  
5 circuits in a network;

6 detecting a failure on said first virtual circuit; and

7 switching transmission of said data from said first virtual circuit to a  
8 second virtual circuit of said plurality of virtual circuits in said network.

1           26.    The computer readable medium according to claim 25, wherein  
2   said network is an Internet Protocol (IP) network.

1           27.    The computer readable medium according to claim 25, wherein  
2   said network is an Asynchronous Transfer Mode (ATM) network.

1           28.    The computer readable medium according to claim 25, wherein  
2   said transmitting further comprises:  
3           transmitting a plurality of detecting cells along said first virtual circuit,  
4   said second virtual circuit, and each virtual circuit of said plurality of virtual  
5   circuits.

1           29.    The computer readable medium according to claim 28, wherein  
2   said plurality of detecting cells are transmitted at a predetermined frequency.

1           30.    The computer readable medium according to claim 28, wherein  
2   each detecting cell of said plurality of detecting cells is an operation and  
3   management (OAM) loopback cell having a correlation tag with incrementing  
4   sequence number.

1           31.    The computer readable medium according to claim 28, wherein  
2   said detecting further comprises:

3 receiving said plurality of detecting cells; and  
4 detecting a predetermined gap in said plurality of detecting cells on said  
5 first virtual circuit.

1 32. The computer readable medium according to claim 31, wherein  
2 said predetermined gap includes three detecting cells of said plurality of  
3 detecting cells.

1 33. The computer readable medium according to claim 25, wherein  
2 said method further comprises transmitting a plurality of detecting cells along  
3 each virtual circuit of said plurality of virtual circuits.

1 34. The computer readable medium according to claim 31, wherein  
2 said method further comprises:  
3 detecting a predetermined sequence of detecting cells of said plurality of  
4 detecting cells on said first virtual circuit; and  
5 switching transmission of said data from said second virtual circuit to  
6 said first virtual circuit.

1 35. The computer readable medium according to claim 31, wherein  
2 ~~said method further comprises:~~

3 detecting a predetermined sequence of detecting cells of said plurality of  
4 detecting cells on said first virtual circuit; and  
5 maintaining transmission of said data along said second virtual circuit.

1 36. The computer readable medium according to claim 34, wherein  
2 said predetermined sequence includes five detecting cells of said plurality of  
3 detecting cells.

1 37. The computer readable medium according to claim 25, wherein  
2 said data comprises Asynchronous Transfer Mode (ATM) cells.

1 ~~38.~~ An apparatus comprising:  
2 means for transmitting data along a first virtual circuit of a plurality of  
3 virtual circuits in a network;  
4 means for detecting a failure on said first virtual circuit; and  
5 means for switching transmission of said data from said first virtual  
6 circuit to a second virtual circuit of said plurality of virtual circuits in said  
7 network.

1 39. The apparatus according to claim 38, wherein said network is an  
2 Internet Protocol (IP) network.



1 40. The apparatus according to claim 38, wherein said network is an  
2 Asynchronous Transfer Mode (ATM) network.

1 41. The apparatus according to claim 38, further comprising:  
2 means for transmitting a plurality of detecting cells along said first  
3 virtual circuit, said second virtual circuit, and each virtual circuit of said  
4 plurality of virtual circuits.

1 42. The apparatus according to claim 41, wherein said plurality of  
2 detecting cells are transmitted at a predetermined frequency.

1 43. The apparatus according to claim 41, wherein each detecting cell  
2 of said plurality of detecting cells is an operation and management (OAM)  
3 loopback cell having a correlation tag with incrementing sequence number.

1 44. The apparatus according to claim 41, further comprising:  
2 means for receiving said plurality of detecting cells; and  
3 means for detecting a predetermined gap in said plurality of  
4 detecting cells on said first virtual circuit.

1 45. The apparatus according to claim 44, wherein said predetermined  
2 gap includes three detecting cells of said plurality of detecting cells.

